



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

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**SEP 10 2014**

Ref: R8-EPR-N

Alicia L. Waters  
Dakotas Area Office  
Bureau of Reclamation  
304 East Broadway Avenue  
Bismarck ND 58501

Re: NAWS Draft Supplemental EIS, CEQ  
#20140181

Dear Ms. Waters:

Thank you for the opportunity to review the Bureau of Reclamation's (Reclamation's) Draft Supplemental Environmental Impact Statement (EIS) for the Northwest Area Water Supply Project (NAWS). The U.S. Environmental Protection Agency Region 8 is providing comments consistent with our authority under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The NAWS project is a municipal, rural, and industrial water supply project intended to provide a reliable, high quality water supply to serve a ten-county area in northwestern North Dakota through 2060. In 2008, Reclamation issued its Final EIS on water treatment. The Final EIS was challenged in U.S. District Court by the Province of Manitoba, Canada and the State of Missouri. In March 2010, the court remanded the case to Reclamation. This Draft Supplemental EIS responds to the court's order requiring Reclamation to take a "hard look" at the cumulative impacts of water withdrawals on the water levels of Lake Sakakawea and the Missouri River and on the consequences of biota transfer into the Hudson Bay basin.

The Draft Supplemental EIS evaluates five alternatives, including a No Action Alternative. Reclamation identified the Missouri River and Groundwater alternative as its preferred alternative. This alternative entails use of Lake Sakakawea as the primary water source and some blending with water from the Minot and Sindre Aquifers. It also includes a Biota Water Treatment Plant (WTP) at Max, North Dakota. The intent of the Biota WTP is to reduce the project-related risk of aquatic invasive species transfer across the divide between the Missouri River and Hudson Bay basins. The Draft Supplemental EIS contains a thorough evaluation of the risk of aquatic invasive biota transfer into the Hudson Bay basin and EPA is impressed with the strong level of protection against biota transfer provided by this project.

The Draft Supplemental EIS identifies the preferred Biota WTP option as "Chlorination/UV Inactivation." Reclamation's NEPA process for this project has been ongoing for many years. During that time, EPA has developed an improved understanding of the conditions under which

drinking water disinfection with chlorine or chloramine can result in the formation of disinfection byproducts (DBPs). DBPs pose a risk to human health when present in drinking water at concentrations above their Maximum Contaminant Levels (MCLs). DBPs are formed in the treatment process when chlorine or chloramine has contact time with natural organic matter. The regulated DBPs, total trihalomethanes (TTHMs) and haloacetic acids five (HAA5) are very small molecules and once formed are not easily removed through subsequent water treatment processes. The potential for forming DBPs can be reduced below levels of concern through treatment practices that remove organic matter prior to disinfection. The Detailed Comments section of this letter provides detailed discussion regarding the following factors that increase DBP formation associated with the proposed Chlorination/UV Inactivation treatment process:

- The NAWS project will switch the drinking water source from groundwater to surface water. Surface water typically has higher levels of organic matter, and therefore has a higher potential to form DBPs.
- The Chlorination/UV Inactivation process described in the EIS treats the water with chlorine *before* filtering out the organic matter thereby creating a higher potential to form DBPs.
- There is also a long contact time in the distribution system as the treated water travels from the biota treatment plant in Max, N.D. to Minot, N.D. and to communities beyond.

The backup plan proposed in the Draft Supplemental EIS to address any DBP issues suggests switching the chemical disinfectant from chlorine to chloramine. Unfortunately, emerging information is showing chloramine can also produce DBPs and other water quality issues with associated human health risks. The best remaining post-construction option would be to add a treatment process that would lower the levels of precursors to DBPs before chlorine is added. That type of modification would be more costly to add after biota treatment plant construction and could delay the ability of the system to provide its intended water quality and resource protections.

This letter identifies opportunities to enhance NAWS' resilience in the face of environmental changes that could affect source water quality. It also identifies opportunities for increased flexibility to address future regulatory changes. The recommendations are intended to support NAWS' goals of providing a reliable, high quality water supply to communities and rural water systems in northwestern North Dakota and meeting the NPDWRs, while reducing risk of aquatic biota transfer. Our primary recommendation for reducing DBP formation potential is to change the preferred Biota WTP option to the "Conventional Treatment" alternative analyzed in the Draft Supplemental EIS. The Conventional Treatment alternative would also increase the system's flexibility to address possible source water quality and regulatory changes that may occur over the 60 year life of the treatment plant. Alternately, we recommend developing and including in the Final EIS an adaptive management approach to address the potential for DBP issues. Our detailed comments identify options for pre-construction adaptive management, perhaps best described as design-level engineering. To be most useful to decision-makers, such as Reclamation itself and the City of Minot, we recommend including the specific adaptive management plan in the Final EIS. That would also allow an opportunity for agencies and the public to understand the plan and provide useful input. Finally, it would assure the plan is available prior to WTP construction.

The enclosed Detailed Comments provide additional information on the following topics: Alternatives (including the Biota WTP options and the in-basin alternatives), Adaptive Management and Monitoring, DBP Formation Potential, Groundwater, Water Conservation, Climate Change (including its potential effect on NAWS and cyanotoxins) and Water Quality.

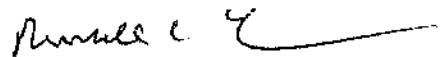
### **Conclusion and Rating**

Based on our review, and in accordance with the enclosed rating criteria, the EPA has rated the Draft Supplemental EIS as "Environmental Concerns – Insufficient Information" ("EC-2"). The EC rating signifies that the EPA's review has identified environmental impacts that should be avoided in order to fully protect the environment. Specifically, the preferred biota treatment plant design may result in drinking water quality issues that could affect human health. This letter points to options available in the Draft Supplemental EIS that would avoid or reduce these effects below levels of concern. The "2" rating signifies that the Draft Supplemental EIS does not contain sufficient information for the EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment. We recommend additional information be added in the Final EIS for alternatives, adaptive management and NPDWR attainment as outlined in our comments above and described further in our enclosed detailed comments. The EPA recommends this information be incorporated into the Final EIS. A description of the EPA's rating system can be found at:

<http://www.epa.gov/compliance/nepa/comments/ratings.html>.

The EPA appreciates the opportunity to participate in the review of this project. We would like to discuss our comments and thoughts regarding Biota WTP options and DBPs with Reclamation, the City of Minot, the North Dakota Water Commission and the North Dakota Department of Public Health once you have had a chance to review them. If we may provide further explanation of our comments, please contact me at 303-312-6693, or Maggie Pierce, Lead NEPA Reviewer, at 303-312-6550.

Sincerely,



Russell C. Leclerc  
Acting Program Director  
NEPA Compliance and Review Program  
Office of Ecosystems Protection and Remediation

Enclosure: Detailed comments

cc: Dan Jonasson, City of Minot Public Works  
Michelle Klose and Tim Freije, North Dakota Water Commission  
Greg Wavra, North Dakota Department of Health



**U.S. EPA Region 8's Detailed Comments:  
Northwest Area Water Supply Project**

**I. Alternatives**

- A. Biota WTP Options.** As discussed in our comments below on “Disinfection byproduct formation potential,” EPA has important concerns with the ability of the preferred Biota Water Treatment Plant (WTP) option, “Chlorination/UV Inactivation Treatment to meet project goals for drinking water quality.” Compared to Chlorination/UV Inactivation, the “Conventional Treatment” option described in the Supplemental Draft EIS offers effective biota treatment and also represents a substantial reduction in disinfections byproducts (DBP) formation risk. It includes physical removal processes prior to chlorination reducing the potential for formation of DBPs. The “Enhanced Chlorination/UV Inactivation” option sometimes uses a physical removal technique prior to chlorination but is limited in its protectiveness of drinking water quality and human health as we discuss below.

***Recommendations:***

- Reconsider the Biota WTP option selected in light of the information provided in this section and our comments in the “DBP formation potential” section.
- If the Final EIS maintains the “Chlorination/UV Inactivation” option for the Biota WTP, incorporate a more complete discussion of the preferred alternative’s potential effect on DBPs (see discussion on DBPs) and an adaptive management plan to address the potential for DBP formation issues.

**1. Enhanced Chlorination/UV Inactivation Treatment Option.** The justification for the microorganism reduction anticipated at the Biota WTP is incomplete because the Draft Supplemental EIS does not discuss whether a coagulant will be used as part of the treatment process (p. 2-49). If no coagulant is used, rapid sand filtration achieves significantly less microorganism removal (at most 0.5 logs) irrespective if it is “pressure,” “direct” or “conventional” filtration. The rapid rate sand used in pressure, direct or conventional filtration is designed to always be used in conjunction with a coagulant.<sup>1</sup> The logs of removal identified in Table 2-21 appear to assume use of a coagulant. It would not be correct to apply the safety factor and assume the logs of removal associated with pressure filtration (which assumes use of a coagulant) unless a coagulant is being used.

***Recommendations:***

- Clarify if a coagulant will be used at all times. If a coagulant is used, then use the log removal data for direct filtration in Table 2-21.
- If coagulation is added, use a coagulant at all times irrespective of the turbidity levels in the raw water.
- If a coagulant will not be added, then revise the title of this option to “Rapid sand filtration without coagulant/chlorination/UV.”

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<sup>1</sup>Rapid rate sand media is described in *Recommended Standards for Water Works* as having a uniformity coefficient of not greater than 1.65 and an effective size of 0.45 to 0.55 mm.

**2. Riverbank filtration.** The EPA has previously recommended consideration of riverbank filtration, to supplement or as an alternative to filtration at the Biota WTP, as an effective means to reduce algae and other precursors to DBP formation. The EPA notes the Draft Supplemental EIS does not discuss riverbank filtration. Sometimes the geology will allow riverbank filtration to be installed directly and, where geology is not conducive, artificial infiltration basins can be created.

***Recommendations:***

- Include a discussion on riverbank filtration as a means to reduce precursors to DBPs.
- Incorporate riverbank filtration as an intake option to be considered through a pre-construction adaptive management approach or design-level engineering.

**B. Inbasin Alternatives.** The Draft Supplemental EIS analyzes two action alternatives that entail recharging groundwater with Souris River water. The surface water hydrologic analysis indicates that it is unlikely that recharge goals would be met in anything other than above average precipitation years. The flow analyses for these alternatives project 73 to 83 zero flow days in a dry year (Tables 4-4 and 4-5, Figure 4-25). The frequent elimination of flow, i.e. zero flow days, may limit these recharge goals from being recognized. The amount of recharge water that can be provided by the Souris River may support a smaller recharge rate than what has been analyzed.

The Draft Supplemental EIS conveys that the modeled flow reductions for the Souris River alternatives do not account for border flow agreements that would maintain flow at the border with Canada. It is important that the minimum requirements from the border flow agreements are considered as a component when calculating a recharge rate that would be supported by the Souris River.

***Recommendations:***

- Identify an artificial aquifer recharge rate that would be supported by the Souris River and its border flow constraints and relate it to the project demand.
- Consider in the Final EIS whether this alternative can achieve project goals while minimizing its impact as a stand-alone alternative or a component of another alternative (i.e., coupled with another alternative water source or conservation).

## **II. Adaptive Management & Monitoring**

The EPA supports Reclamation's intent to develop an adaptive management plan (p. 4-6, Appendix F). The Draft Supplemental EIS indicates that Reclamation would develop an adaptive management plan at some point in the future and would engage the Impact Mitigation Team to implement adaptive management practices. Adaptive management is most effective if it is developed prior to project commencement, providing a framework for decisions to be made quickly and enabling collection of, and agreement on, the information and/or data necessary to inform those decisions.

Reclamation specifies its intent to develop adaptive management planning for future environmental changes that lead to an increased potential for DBP formation and to extend this adaptive management plan process to all future National Primary Drinking Water Regulations (NPDWRs) (p. 2-56, Appendix F). If the Final EIS maintains the “Chlorination/UV Inactivation” Biota WTP option, it will be important to incorporate Biota WTP options that enable physical removal of DBP precursors prior to chlorination among adaptive management options. It is important for the Final EIS to acknowledge that a post-construction adaptive management approach potentially delays NPDWR compliance and may require significant capital investment should a problem arise. These challenges may be best met through a *pre-construction* adaptive management approach, or project design-level engineering, as NAWs moves beyond its current appraisal-level design stage. Monitoring to support the adaptive management approach has not been specified in Appendix F. It is unclear whether monitoring activities discussed in the body of the Draft Supplemental EIS will include monitoring to support the adaptive management approach. Monitoring is an important component of adaptive management and also important to establish baseline conditions.

***Recommendations:***

- Develop an Adaptive Management Plan for inclusion in the Final Supplemental EIS to give the public and other interested parties an opportunity to provide input.
- Use a pre-construction/project design approach for adaptive management as the project moves beyond appraisal-level engineering analysis.
- Consider treatment options for biota removal at the Biota WTP that will allow removal processes prior to chlorination.
- Include adaptive management triggers and action options associated with those triggers that support both the goals of reducing biota transfer potential and providing a safe, reliable source of drinking water.
  - Triggers should include: data that demonstrate difficulty in meeting NPDWRs or risks to public health and new NPDWRs that could result in the need to make treatment changes.
  - NPDWRs (discussed further below) of concern include: total trihalomethanes (TTHMs), haloacetic acids five (HAA5s)
  - Presence of chemicals of concern for which there are no current NPDWRs such as *N*-Nitrosodimethylamine (NDMA), and cyanotoxins.
  - Available actions/system modification options include: riverbank filtration and filtration prior to chlorination.
- Identify in Appendix F the monitoring necessary to support adaptive management decisions.
  - Necessary monitoring may include NPDWRs, algal abundance through chlorophyll *a*, cyanobacteria (through cells or cyanotoxins), biota and groundwater levels.

**III. DBP Formation Potential**

The Draft Supplemental EIS does not fully evaluate the preferred Biota Treatment Plant alternative’s potential to result in DBP formation (p. 2-56) and does not address how to reduce that potential effect through adaptive management. The EPA has identified factors that may

make it challenging to meet the NPDWR for DBPs. Those factors include the lack of precursor removal technologies prior to chlorination, the residence time between Max and Minot and the overall distribution system length (approximately 184 total miles) (p. 2-56). The Draft Supplemental EIS references a study (Montgomery et al. 2007) that characterized DBP formation potential as low. Because this study is based upon a laboratory experiment that does not capture environmental variability or reflect conditions of the distribution system, utilizing additional data collected by Minot and its consecutive systems may help characterize potential DBP increases in the system.

**Recommendation:** We recommend that the Final EIS discuss the preferred alternative's potential to produce DBPs, addressing the following topics:

- A. **Prechlorination and DBPs.** Prechlorination at the Max Biota WTP will result in the formation of regulated and unregulated DBPs because DBP precursors are not being removed. In the 1997 DBP rule<sup>2</sup>, the EPA considered eliminating prechlorination in regulation (except for maintenance) in its risk/risk balance between DBPs and endemic disease. The EPA decided not to eliminate prechlorination, for several reasons, one of which was the high national capital cost of expanding contact basins after filtration would shift the risk/risk balance to increases in endemic diseases. As a result of studies, the EPA did establish that for three groups of DBPs: TOX (Total Organic Halides), TTHMs and HAA5s, "moving the point of chlorination downstream (closer to filtration) in the coagulation, flocculation, and sedimentation process, decreased DBP formation and the chlorine demand by providing additional time for NOM removal before chlorine could react with NOM to form DBPs."<sup>2</sup> Once initial DBPs are created after chlorination at the Biota WTP, those levels are likely to increase with residence time as the water flows through the 184 total miles of distribution system (see section on DBPs and residence time). Chlorination leads to the formation of the majority of regulated DBPs (TTHMs, HAA5s) and greater than 600 unregulated DBPs have been found for which health effects have not yet been evaluated. The EPA's concern regarding the health effects of this suite of DBPs led to a rule to support their minimization (40 CFR 141.135).
- B. If TTHMs and HAA5s exceed the NPDWRs, the only option for the preferred Biota WTP option would be to reduce the chlorine contact time and increase chloramine contact time which decreases the established biota transfer goals. Recent information indicates that chloramine disinfection leads to the formation of a different suite of DBPs for which less is known about their health effects. One of the known chloramine DBPs is NDMA, a potent human carcinogen. Systems that use chloramines also frequently experience problems with nitrifying bacteria. Nitrifying bacteria deplete the chloramine residual and produce nitrate in the distribution system. The EPA recognizes that nitrate formed in the distribution system is not currently regulated. However, nitrifying bacteria problems are difficult to address, the solutions often presenting additional problems for NPDWR attainment.<sup>3</sup> For this project, the EPA recommends treatment alternatives that focus on the removal of precursors to DBP formation.

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<sup>2</sup> 62 *Federal Register* 59461, Nov 27, 1997. (40 CFR Parts 141 and 142, National Primary Drinking Water Regulations: Disinfectants and Disinfection Byproducts; Notice of Data Availability; Proposed Rule)

<sup>3</sup>One of the solutions to nitrification problems in the distributions system is to perform a chlorine burn. A chlorine burn switches to higher levels of chlorine for a few weeks to months which sheers the biofilm off the pipe walls. This burn releases



- C. **Efficacy of TTHMs and HAA5s removal by treatment.** The very small size of TTHMs and HAA5s make their removal ineffective by most treatment technologies. TTHMs are single-carbon molecules and HAA5s are double-carbon molecules. Granular activated carbon (GAC) is most effective at removing medium molecular weight molecules (including DBP precursors) and not very effective at removing small or very large molecular weight molecules.
- D. **Residence time increases DBP levels.** The initial levels of TTHMs and HAA5s formed at Max will have an opportunity to increase as the precursors continue to react with the chloramine residual as the water travels through the pipeline to the Minot WTP. Minot's WTP does not have technologies in place to effectively reduce TTHMs and HAA5s and, so, levels will continue to increase through the distribution system, which serves several consecutive systems.

Data are available from each of the consecutive systems to evaluate DBP increases as the treated water moves further from Minot. All of these consecutive systems performed an initial distribution system evaluation (IDSE) under Subpart U for the *Stage 2 Disinfectants and Disinfections Byproducts Rule* (Stage 2) and have collected three quarters of data subsequent to the IDSE per Stage 2 Subpart V. Both sets of empirical data are available for further consideration of DBP levels in the Final EIS. These data differ from those in the chloramine challenge study (Montgomery et al. 2007) in that they are based upon DBPs formed within the distribution system (versus a laboratory) and they include multiple data points at different times of the year (versus one grab sample) with water treated at Minot (versus laboratory conditions).

Although these empirical data are from a different raw water source than that used under the preferred alternative, that current raw water source (i.e., groundwater) is likely to be lower in NOM than source water used under the preferred alternative (i.e., surface water blended with groundwater). Additionally, these data capture seasonal variability and the effect of the distribution system's residence time and biofilms (i.e., the conditions water will be exposed to and another source of NOM). These data could be assessed in consideration of the system modifications (prechlorination at Max and additional residence time from Max to Minot).

- E. **DBP precursors at the source are likely to vary due to climate change.** NOM, measured as total organic carbon (TOC), varies with nutrient concentrations. Climate change exacerbates drought and flood cycles which in turn affect nutrient concentrations (p. 4-9). During drought, nutrients accumulate on the land without adequate precipitation to wash them away in small increments. During flooding, these nutrients are transported into waterways via overland flow along with increased flow from septic systems and wastewater treatment plants. These nutrients trigger algal, plant, and microorganism growth which increases the levels of NOM (i.e., DBP precursors). Without physical

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very high levels of TTHMs and HAA5s and other accumulated contaminants off the pipe walls and is not flushed but rather allowed to stay in the pipe network to be ingested.

removal treatment at the Biota WTP, the higher levels of precursors will lead to higher levels of DBPs. An example of this phenomenon occurred on the Milk River in Montana.

#### **IV. Groundwater**

The preferred alternative's effect on groundwater appears uncertain because a sustainable rate of groundwater withdrawal is unknown and, consequently, comparison to the project's withdrawal rate is not possible (p. 2-6, p. 3-26, p. 4-60). The Draft Supplemental EIS indicates that a sustainable rate is something lower than 2 mgd (p. 2-6). It also states that the reduction in the long-term average and the peak pumping rates from 2 and 3.2 mgd to 1 and 2.6 mgd, respectively, "could stabilize and/or reverse the downward trend in water levels over the long term if the new rate of withdrawal is less than the natural recharge rates of the aquifers (p. 4-60)." The Draft Supplemental EIS does not make a comparison between the project and the natural recharge rate, and does not consider groundwater level trends or anticipated changes in recharge rates (such as those attributable to climate change) (p. 4-60). The document does note that if a larger percentage of annual precipitation is in the form of intense rain events with high runoff, as predicted by the *Literature Synthesis on Climate Change Implications for Water and Environmental Resources* (Reclamation 2011a), less of that water could infiltrate and recharge aquifers (p. 4-11). Consideration of more recent withdrawal rates, groundwater level trends and anticipated impacts due to climate change are important considerations to understand the effect of the project.

The Final EIS may also consider the cumulative effects and project adaptations if the groundwater trend is observed to continue to decline even given the reduction in groundwater withdrawal. Considerations include the effect of climate change and whether more Missouri River water will be used as part of an adaptive management strategy in response to groundwater declines.

#### **Recommendations:**

- Compare the withdrawal rates to more recent withdrawal rates (e.g., a ten-year average instead of the 45-year average used) to better characterize and frame the current withdrawal rates.
- Consider cumulative effects or adaptive management options in light of the uncertainty related to sustainable groundwater withdrawals.

#### **V. Water Conservation**

The conclusion that there would be limited opportunity for additional water conservation because of current low water use (much lower than the national average) does not consider future savings attributable to either active or passive conservation. Passive conservation savings include those due to xeriscaping, increased household appliance efficiency and replacement of those appliances. Site-specific analysis of potential conservation savings for the project area could be relevant to the cumulative effects analysis for withdrawals to the Missouri River. The Draft Supplemental EIS considers existing water demand reduction attributable to conservation but does not describe opportunities for future reduction or whether those opportunities could reduce project demand (p. 2-10).

**Recommendation:** Identify potential additional active and passive conservation strategies specific to the NAWS service area and incorporate those savings into a reduced demand projection or as a component of an alternative.

## **VI. Climate change**

- A. Effect on NAWS.** The Draft Supplemental EIS describes potential climate change effects for the region and the Missouri River Operations. It does not connect those effects as they relate to groundwater (p. 4-11), increased algal blooms (p. 4-9), or DBPs to the project's ability to meet its purpose or the ability of alternatives to adapt to those changes.

**Recommendation:** Relate the effect of climate change specifically to the NAWS project, identifying areas where alternatives may need to adapt in order to meet goals.

- B. Cyanobacterial toxins.** As discussed above in section III(C), climate change has the potential to increase the magnitude of nutrient loading spikes to reservoirs such as Lake Sakakawea. As the Draft Supplemental EIS acknowledges, although an overall increase in precipitation is predicted, "climate change studies also predict increases in the frequency of intense and heavy rainfall interspersed with longer relatively dry periods (p. 4-14)." Dry periods allow nutrients to accumulate on the land and then higher intensity precipitation events wash them in the rivers, contributing to increased algal blooms and DBPs (see section on DBPs). These cycles can have a dramatic impact to the water quality resulting in blooms of algae and cyanobacteria that have the potential to reduce the effectiveness of the water treatment process's ability to deliver safe drinking water. The description of cyanobacterial toxins does not consider climate change effects in detail (p. 4-9). Not all the treatment options in the Draft Supplemental EIS have the ability to respond to a cyanobacterial algal bloom.

A recent example of how dramatic changes in weather patterns associated with climate change can affect water quality was demonstrated in Toledo, Ohio. Wet, rainy conditions increased overland fertilizer and waste transport, and increased flow from waste water treatment plants, septic systems and stormwater. These flows added high levels of nutrients to Lake Erie, contributing to a cyanobacterial algal bloom. Although the City of Toledo, Ohio, detected microcystins at 1.5 ppb, just 0.5 ppb above the World Health Organization Standard of 1 ppb, the City responded by issuing a "do not drink" order on July 1, 2014. This order was issued despite the lack of cyanotoxin regulation. Notably, the National Oceanic and Atmospheric Administration rated the bloom as only a 5 or 6 (out of 10). Nonetheless, this small bloom, that happened to be producing toxins, was positioned directly over Toledo's intake due to the wind patterns during the unusually wet and cold weather in this area.

There are concerns associated with those treatment options that do not have the capability to remove cyanobacteria and to prevent cyanotoxins from entering the drinking water system. For example, if testing indicated the presence of cyanobacterial toxins, the recommendations for treatment to protect public health would be to turn off any prechlorination, increase coagulant levels, increase powdered activated carbon and decrease the filtration rate. The

goal of these recommendations would be to remove whole cells and avoid the release of toxins that occurs when the cells are damaged. This goal could not be accomplished with some of the treatment options for NAWS.

- This link has a list of labs that perform cyanotoxins and cyanobacteria analyses:  
<http://www2.epa.gov/nutrient-policy-data/state-resources>
- This link discusses cyanobacteria and treatment with a focus on keeping the cells intact:  
<http://www2.epa.gov/water-research/harmful-algal-blooms-cyanobacteria>

**Recommendation:** Expand the discussion of cyanobacterial toxins to include the status of regulation, examples, and the ability of the different treatment options to treat cyanobacterial toxins.

## **VII. Water Quality**

Table 3-16 identifies waterbodies that will be affected by the project. We suggest that including upstream water quality data points for the affected river and tributary reaches as well as the mechanisms by which they may be affected would provide a clearer description of impacts.

1. **Missouri River.** Chapter 3 states that Missouri River water quality is good and references EPA STORET data, but does not provide summary data to characterize water quality (p. 3-40). Additionally, the EIS's use of Maximum Contaminant Levels (MCLs) (i.e., NPDWRs) for comparison to average surface/source water quality could be better framed (p. 3-40). MCLs are maximum (versus average) limits that apply to treated water per the SDWA although some CWA water quality standards are based on MCLs. A summary of actual data and assessment of applicable water quality standards with North Dakota methods would better characterize water quality.
2. **Souris River.** Table 3-6 compares surface water quality of the Souris River to SDWA-based and aquatic life-based water quality standards, breaking all of them into two categories: primary and secondary. Please note that phrases "primary" and "secondary" standards describe SDWA-based standards in the context of their application as *maximum* contaminant levels (MCLs), as discussed above (p. 3-16). It is also important to describe which metric (mean, maximum, or minimum) of the observed data is compared to the CWA standards.

Chapter 3 indicates that the Souris River is impaired for aquatic resources from sedimentation or siltation for segments of the river near Minot per CWA Section 303(d) (p. 3-47). Chapter 4 contains information regarding flow alterations, geomorphic effects and effects to aquatic organisms for the action alternatives affecting the Souris River. It does not relate those effects to the impairment.

### ***Recommendations:***

- Summarize available Missouri River water quality data in a way similar to the data summary provided for the Minot and Sundre Aquifers.
- Clarify that MCLs are assessed as maximums and apply directly to treated water although some CWA water quality standards are MCL-based.

- Clarify use of the terms “primary” and “secondary.”
- Update Table 3-16 to identify the upstream points.
- Relate effects to flow alterations, geomorphology and aquatic organisms to the CWA Section 303(d) impairment on the Souris River.

